

**14900**

## **Gulf and Atlantic Coastal Plain Tidal Marsh Systems**

BpS Model/Description Version: Aug. 2020

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| <b>Modelers</b> |                         | <b>Reviewers</b> |  |
|-----------------|-------------------------|------------------|--|
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|                 |                         |                  |  |
|                 |                         |                  |  |

### **Vegetation Type**

Herbaceous Wetland

### **Map Zones**

37, 98

### **Model Splits or Lumps**

This biophysical setting (BpS) is lumped with: 1486

### **Geographic Range**

Southwest Louisiana to southeast Texas from Vermillion Bay west to Galveston Bay, as far north as the tidal influence. This BpS differs from the marsh found in map zone (MZ)36 because of their different coastal positions and salt content.

### **Biophysical Site Description**

This BpS occurs on the Chenier Plains of Louisiana and Texas. Synonyms of this BpS are coastal marsh and cordgrass marsh.

### **Vegetation Description**

This area was historically dominated by tall grass coastal marshes in fresh to intermediate marsh within the coastal Chenier Plains in micro tidal to tidally influenced wetlands. Dominant grasses ranged from *Cladium jamaicense* (Sawgrass) and *Zizaniopsis miliacea* (giant cutgrass) within to the freshest zone to *Spartina patens* (salt marsh/marsh hay cordgrass) and *Schoenoplectus californicus* (California Bulrush) in the wet zones with slight tidal influences, marsh hay cordgrass and *Phragmites communis* (roseau cane/common reed) within seasonal wetlands, and *Spartina spartinea* (gulfcoast cordgrass) being the dominant species on the prairie and salty prairie ridges with *Panicum virgatum* (switchgrass) historically present on fresher ridge locations.

### **BpS Dominant and Indicator Species**

| <b>Symbol</b> | <b>Scientific Name</b>             | <b>Common Name</b>   |
|---------------|------------------------------------|----------------------|
| CLADI         | <i>Cladium</i>                     | Sawgrass             |
| SPPA          | <i>Spartina patens</i>             | Saltmeadow cordgrass |
| PHAU7         | <i>Phragmites australis</i>        | Common reed          |
| ZIMI          | <i>Zizaniopsis miliacea</i>        | Giant cutgrass       |
| SCCA11        | <i>Schoenoplectus californicus</i> | California bulrush   |
| SPSP          | <i>Spartina spartinea</i>          | Gulf cordgrass       |
| BAHA          | <i>Baccharis halimifolia</i>       | Eastern baccharis    |

|       |                                  |                      |
|-------|----------------------------------|----------------------|
| SCAM6 | <i>Schoenoplectus americanus</i> | Chairmaker's bulrush |
|-------|----------------------------------|----------------------|

Species names are from the NRCS PLANTS database. Check species codes at <http://plants.usda.gov>.

### Disturbance Description

The area is subject to frequent wildfire either from lightning or anthropogenic fire, with more frequent fire occurrence probably being typical. Tidal flooding events are uncommon unless direct landfall of tropical storms or hurricane passage. These events could create disturbance conditions varying from zones killed by salt water flooding to areas where surface vegetation and root material is torn from the marsh. Drought was also a disturbance factor, with impacts varying from large area die-off after tidal flooding events to occurrences of peat fire that all the creation of large open water areas after removal of all below ground vegetative matter. Frequent flooding during periods of above average rainfall was not uncommon. Herbivory from native ungulate, waterfowl and muskrat were additional disturbance factors that altered the plant community. This herbivory probably followed the occurrence of fire and could lead to further alteration of the vegetative community.

### Fire Frequency

| Severity         | Avg FI | Percent of All Fires | Min FI | Max FI |
|------------------|--------|----------------------|--------|--------|
| Replacement      | 11     | 100                  |        |        |
| Moderate (Mixed) |        |                      |        |        |
| Low (Surface)    |        |                      |        |        |
| All Fires        | 11     | 100                  |        |        |

Fire interval is expressed in years for each fire severity class and for all types of fire combined (All Fires). Average FI is the central tendency modeled. Percent of all fires is the percent of all fires modeled in that severity class. Minimum and Maximum FIs show the relative range of fire intervals as estimated by model contributors, if known.

### Scale Description

This BpS occurred across thousands of acres of Chenier Plains in Louisiana and Texas.

### Adjacency or Identification Concerns

This BpS grades into the Gulf of Mexico to the south. The eastern border transitions into the delta marshes with very similar plant communities characterized by soils from the Mississippi River Delta. The northern edges feather into the coastal prairies BpS with an often hard to define transition zone between the two. The western BpS changes around the western edge of Galveston Bay and has a very similar plant community. However, the width of the wetlands is very narrow, and is characterized by firmer sandy soils with less rainfall. The occurrence of fire seems to be much less frequent due to lack of lightning occurrence.

### Issues or Problems

There is very little historical data about this system prior to 1920.

The fire history within this BpS was on a frequent occurrence of 2-5yrs with patches that could go for periods of up to 15yrs without fire. Fire appears to be tied to weather patterns with more frequent fire occurrence during drought or drier seasons. Flooding impacts by tropical storms and hurricanes could vary greatly and are not well understood. Changes in hydrology have greatly altered the plant community across most of this BpS due to salt water influences and increased drainage. Most of the cutgrass and sawgrass marsh has disappeared. Much of the large expanses of California Bulrush marsh have been lost and converted to marsh hay cordgrass.

### Native Uncharacteristic Conditions

Seasonal wetland marsh sites and salty prairie sites can convert to brushy systems dominated by eastern baccharis (*Baccharis halimifolia*) and Iva. Wetter sites with *S. patens* that remain unburned for seven or greater years tend to die back due to suppressed vegetative growth from the amounts of dead stems density.

### Comments

This model was created for MZ37 by Patrick Walther and did not receive review.

For MZ98 this model was adopted from the MZ37 models without changes. No review was obtained for MZ98.

## Succession Classes

### Mapping Rules

| Upper Layer Lifeform | Height (m) | Canopy Cover (%) |       |       |       |       |       |       |       |       |        |
|----------------------|------------|------------------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
|                      |            | 0-10             | 11-20 | 21-30 | 31-40 | 41-50 | 51-60 | 61-70 | 71-80 | 81-90 | 91-100 |
| Herb                 | 0-0.5      | A                | A     | A     | A     | A     | A     | A     | A     | A     | A      |
| Herb                 | 0.5-1.0    | A                | A     | A     | A     | A     | A     | A     | A     | A     | A      |
| Herb                 | >1.0       | A                | A     | A     | A     | A     | A     | A     | A     | A     | A      |
| Shrub                | 0-0.5      | B                | B     | B     | B     | B     | B     | B     | B     | B     | B      |
| Shrub                | 0.5-1.0    | B                | B     | B     | B     | B     | B     | B     | B     | B     | B      |
| Shrub                | 1.0-3.0    | B                | B     | B     | B     | B     | B     | B     | B     | B     | B      |
| Shrub                | >3.0       | B                | B     | B     | B     | B     | B     | B     | B     | B     | B      |
| Tree                 | 0-5        | B                | B     | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 5-10       | B                | B     | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 10-25      | B                | B     | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN     |
| Tree                 | 25-50      | UN               | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN     |
| Tree                 | >50        | UN               | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN    | UN     |

Succession class letters A-E are described in the Succession Class Description section. Some classes use a leafform distinction where a qualifier is added to the class letter: Brdl (broadleaf), Con (conifer), or Mix (mixed conifer and broadleaf). UN refers to uncharacteristic native or a combination of height and cover that would not be expected under the reference condition. NP refers to not possible or a combination of height and cover which is not physiologically possible for the species in the BpS.

### Description

|                |           |                                             |
|----------------|-----------|---------------------------------------------|
| <b>Class A</b> | <b>72</b> | <b>Early Development 1 - All Structures</b> |
|----------------|-----------|---------------------------------------------|

### Indicator Species

| Symbol | Scientific Name                  | Common Name          | Canopy Position |
|--------|----------------------------------|----------------------|-----------------|
| SPPA   | <i>Spartina patens</i>           | Saltmeadow cordgrass | Upper           |
| CLADI  | <i>Cladium</i>                   | Sawgrass             | Upper           |
| PHAU7  | <i>Phragmites australis</i>      | Common reed          | Upper           |
| SCAM6  | <i>Schoenoplectus americanus</i> | Chairmaker's bulrush | Upper           |

### Description

This is a post-disturbance grassland which results after fire or hurricane tidal surges. Replacement fire will be uncommon in the first growing season after a fire but their frequency will increase as the canopy cover and dead material increases. Native grazing by muskrat, geese and ungulates occurs but was not modeled.

### Maximum Tree Size Class

None

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|                |           |                                 |
|----------------|-----------|---------------------------------|
| <b>Class B</b> | <b>28</b> | <b>Mid Development 1 - Open</b> |
|----------------|-----------|---------------------------------|

### Indicator Species

| Symbol | Scientific Name             | Common Name          | Canopy Position |
|--------|-----------------------------|----------------------|-----------------|
| SPPA   | Spartina patens             | Saltmeadow cordgrass | Middle          |
| BAHA   | Baccharis halimifolia       | Eastern baccharis    | Middle          |
| PHAU7  | Phragmites australis        | Common reed          | Upper           |
| SCCA11 | Schoenoplectus californicus | California bulrush   | Upper           |

### Description

This class grassland is characterized by closed canopy with any of the following: high ratios of dead to live stem densities, high percentages of brushy vegetation present, increasing cover of brushy species, and possibly open areas where dead grass has collapsed into the water. This class can have intense wild fires with extreme flame lengths. Fires are canopy replacement fires.

### Maximum Tree Size Class

None

## **Model Parameters**

### **Deterministic Transitions**

| From Class | Begins at (yr) | Succeeds to | After (years) |
|------------|----------------|-------------|---------------|
| Early1:ALL | 0              | Mid1:OPN    | 10            |
| Mid1:OPN   | 11             | Mid1:OPN    | 999           |

### **Probabilistic Transitions**

| Disturbance Type          | Disturbance occurs In | Moves vegetation to | Disturbance Probability | Return Interval (yrs) | Reset Age to New Class Start Age After Disturbance? | Years Since Last Disturbance |
|---------------------------|-----------------------|---------------------|-------------------------|-----------------------|-----------------------------------------------------|------------------------------|
| Wind or Weather or Stress | Early1:ALL            | Early1:ALL          | 0.03                    | 33                    | Yes                                                 | 0                            |
| Optional 1                | Early1:ALL            | Early1:ALL          | 0.03                    | 33                    | No                                                  | 0                            |
| Replacement Fire          | Early1:ALL            | Early1:ALL          | 0.09                    | 11                    | Yes                                                 | 0                            |
| Optional 1                | Mid1:OPN              | Mid1:OPN            | 0.03                    | 33                    | No                                                  | 0                            |
| Wind or Weather or Stress | Mid1:OPN              | Early1:ALL          | 0.03                    | 33                    | Yes                                                 | 0                            |

|                     |          |            |      |    |     |   |
|---------------------|----------|------------|------|----|-----|---|
| Replacement<br>Fire | Mid1:OPN | Early1:ALL | 0.09 | 11 | Yes | 0 |
|---------------------|----------|------------|------|----|-----|---|

### **Optional Disturbances**

Optional 1: flooding

### **References**

NatureServe. 2007. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA. Data current as of 10 February 2007.

NatureServe. 2006. International Ecological Classification Standard: Terrestrial Ecological Classifications. NatureServe Central Databases. Arlington, VA, U.S.A. Data current as of 18 July 2006.